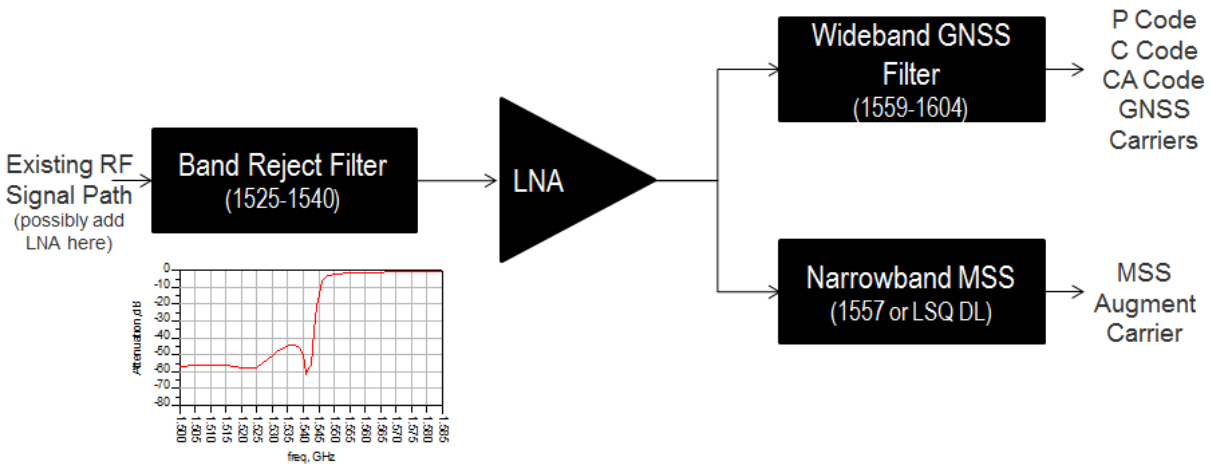
GPS (L1 P-Code) Filter for LightSquared LTE Coexistence

Feasibility Study

Target Spec provided by Greenwood/LightSquared, July 15th, 2011

Precision filter requirement		
Parameter	**Frequency**	**Requirement**
band reject	1525-1536 MHz	40dB over temp and manufacturing
band reject	1626.5-1660 MHz	40dB over temp and manufacturing
Pass band	1559.47-1591.47	3dB BW
Pass band gain	1559.47-1591.47	Standard Avago Practice
Pass band gain flatness	1559.47-1591.47	Best effort
Pass band group delay distortion	1575.42+/-10MHz	6ns over temp and manufacturing
Noise figure	Standard Avago Practice	Standard Avago Practice



Notes on the Simulatons

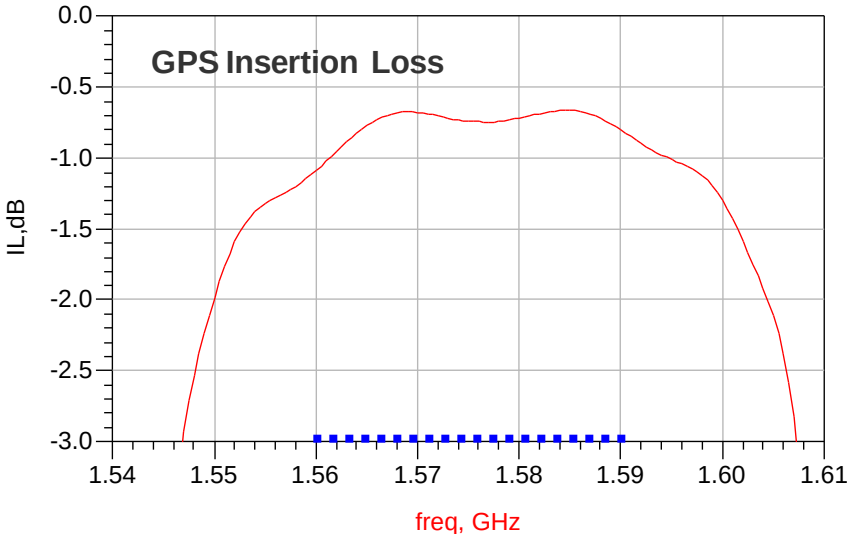
The simulations provided express capability of the Avago FBAR filtering process. There is no intention to imply existence of a product or future existence of a product.

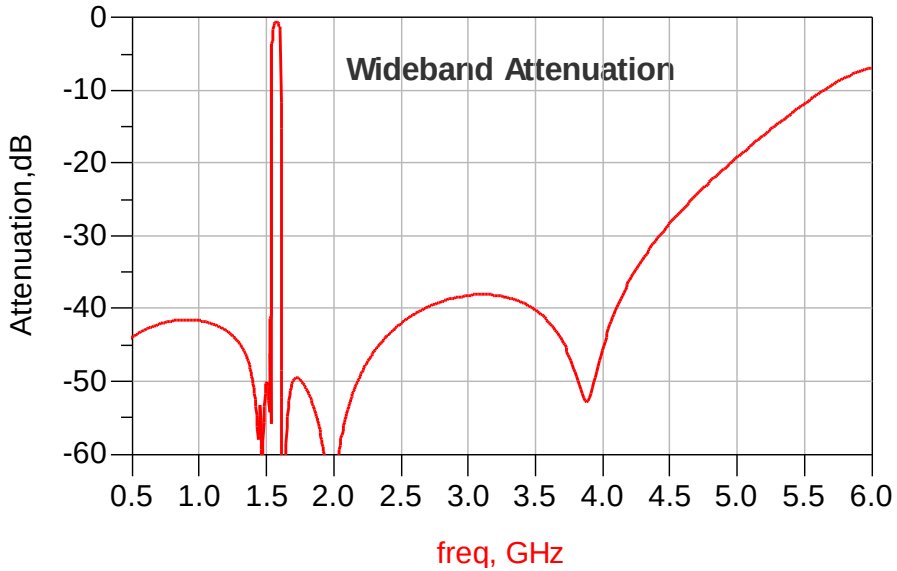
The simulations are relatively simple linear lumped element simulations, not accounting for field interaction and other complex real-life contingencies. It is the experience of Avago that these simulations predict with good accuracy the overall gross aspects of filter response, including rejection. Insertion loss predictions tend to be slightly optimistic, typically by a few tenths of a dB.

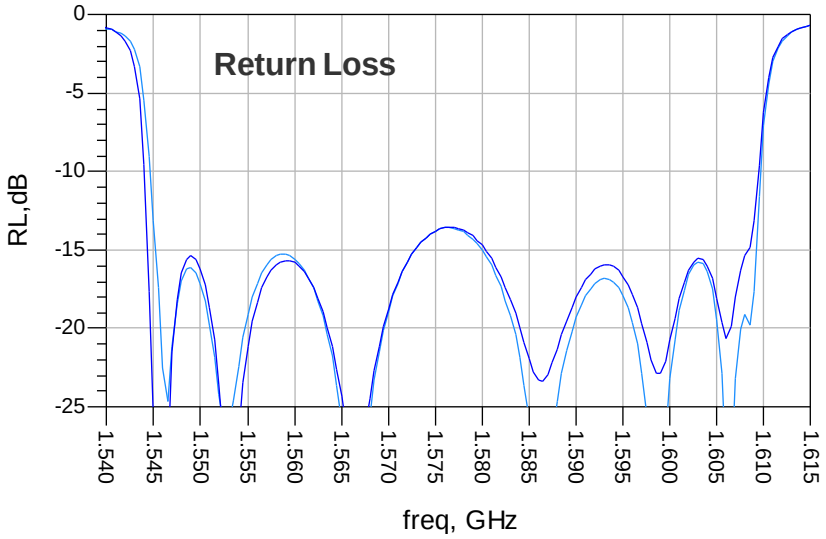
The simulations unless otherwise noted show typical expected performance at room temperature.

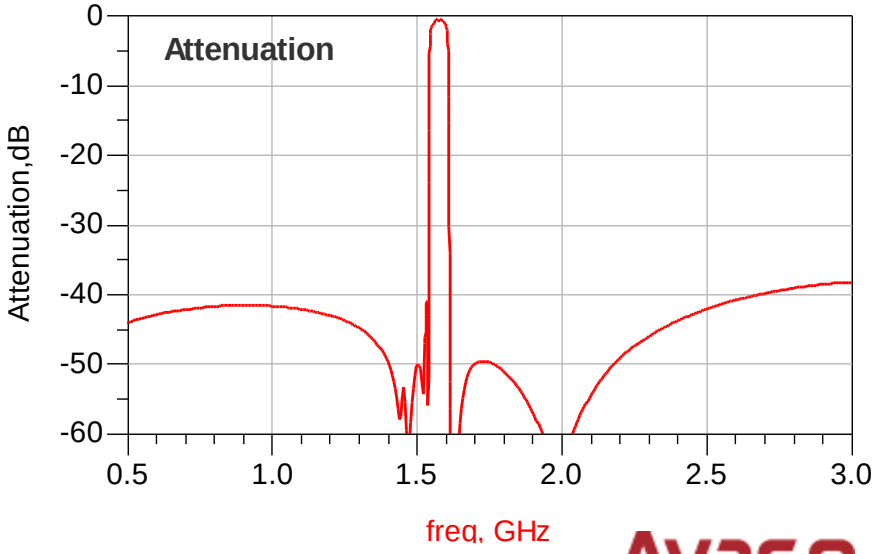
As temperature has the effect of shifting the filter response down in frequency, over temperature performance can be investigated by looking at performance at a frequency offset corresponding to the expected temperature motion. In general the motion will be less than -35 ppm/C. This corresponds to 5.5 MHz motion for a 100 degree C temperature shift at 1575 MHz.

Simulation of Typical Performance (Lumped Element)

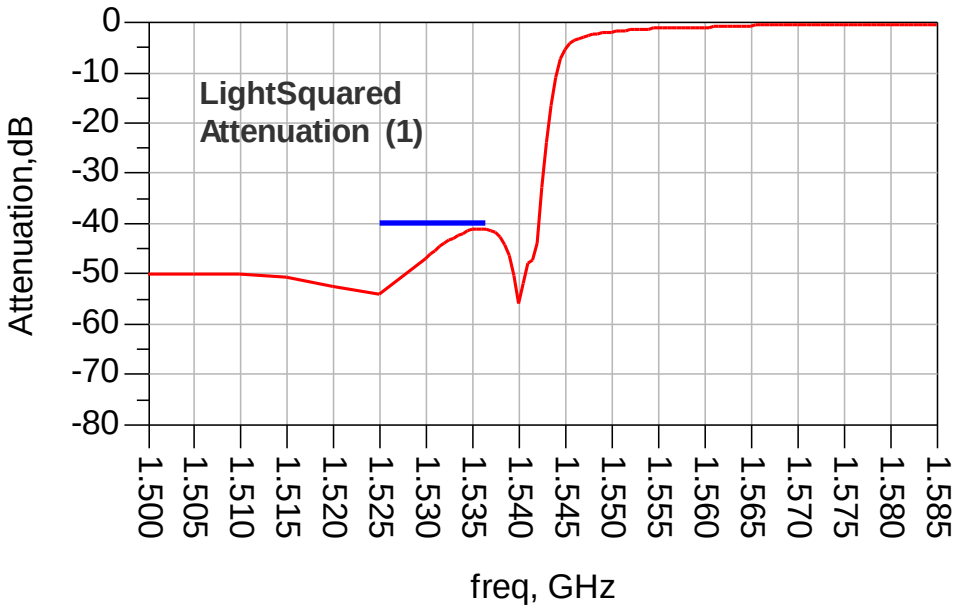


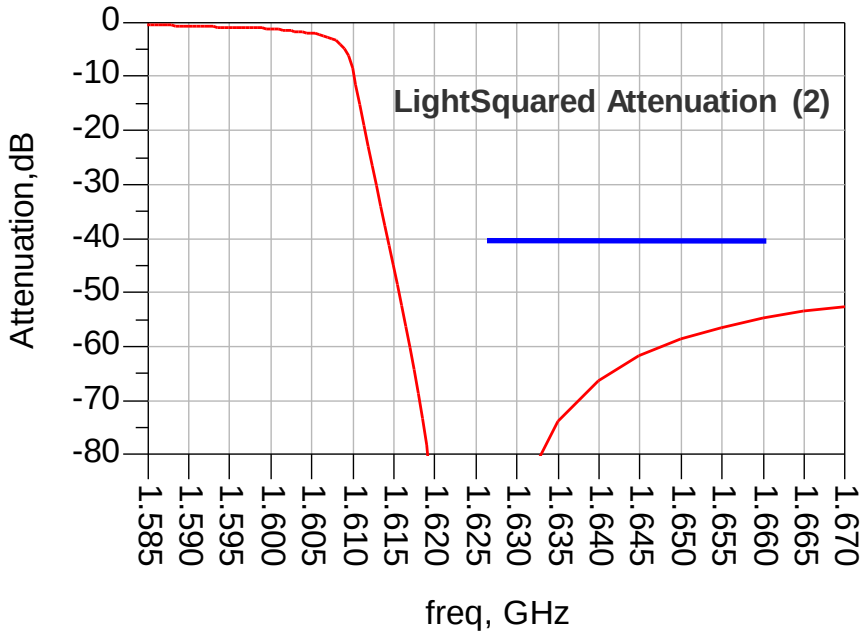




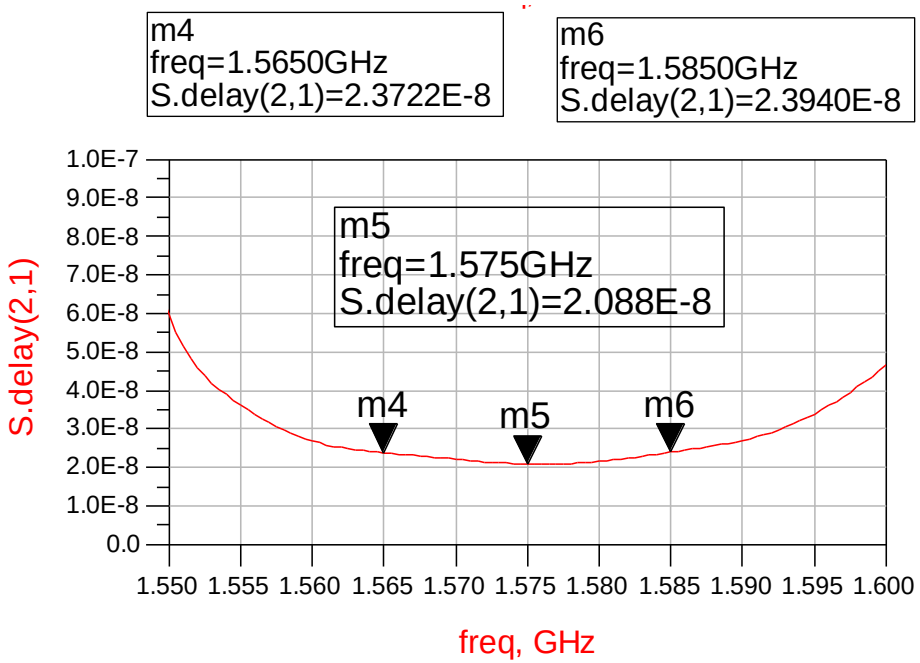


Simulation of Typical Performance (Lumped Element)
Rejection at LightSquared Spectrum



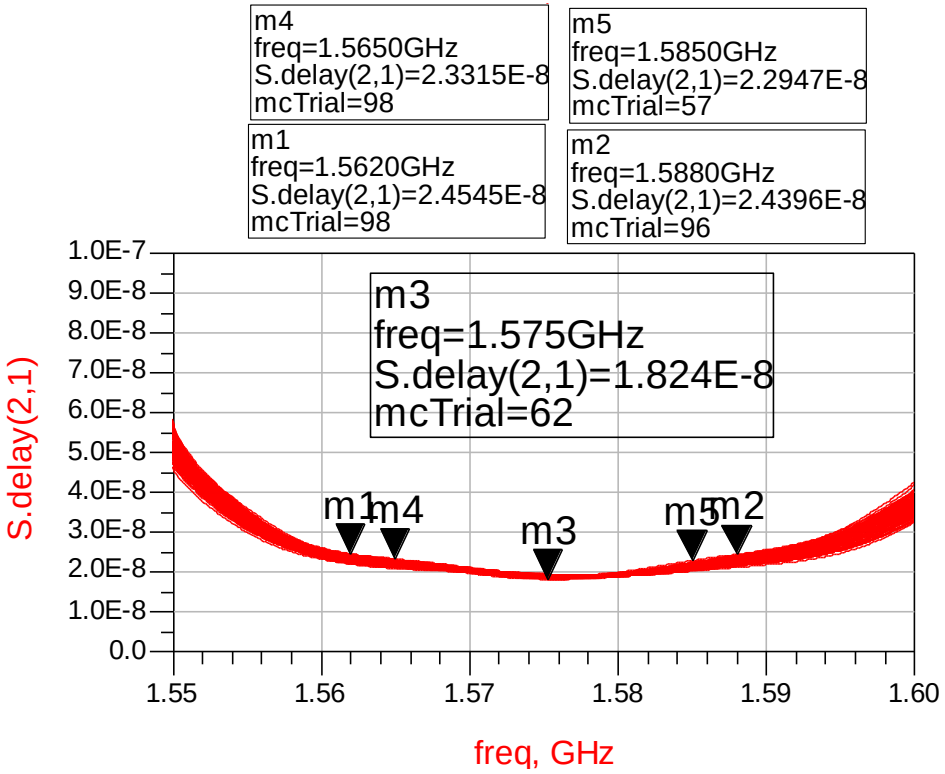


Simulation of Typical Performance (Lumped Element)
Group Delay Distortion



Typical group delay variation at room temperature ~4ns

Simulation of Performance Including Production Variation



Max. group delay variation at Room Temperature incl. production variation ~5ns
Max. group delay variation incl. Temperature and production variation ~7ns